

Forsythe II Project Proposed Action

December 2015

The Boulder Ranger District (BRD) of the Arapaho and Roosevelt National Forests (ARNF) is proposing management activities on 3,901 acres of National Forest System (NFS) lands within the Forsythe II project area. Additionally, 1,969 acres will be analyzed for defensible space. The purpose of this project is to:

- Restore mixed conifer stands toward more characteristic composition, structure, and spatial patterns in order to increase resistance and resiliency to future natural disturbances;
- Increase the size and vigor of aspen stands;
- Maintain and increase meadow habitat;
- Improve wildlife habitat to benefit species within the project area;
- Improve watershed condition;
- Reduce the effects of a wildfire to limit erosion from contaminating municipal water sources;
- Decrease risk of crown fire within the project area, particularly adjacent to private property.

The proposed action includes 3,233 acres of mechanical/hand treatment and 968 acres of broadcast burning for analysis. Both mechanical/hand treatment and broadcast burning would occur on 300 acres.

Project Location

The Forsythe II project area is located east of Nederland, CO and west of Gross Reservoir. The entire project area encompasses 18,954 acres; 9,930 of those acres are NFS lands, 2,187 acres are Boulder County Parks and Open Space lands, and 6,837 acres are private lands.

Proposed Action

The Boulder Ranger District utilized input received during the project scoping, from the public as well as input from internal U.S. Forest Service resource specialists, to develop this detailed proposed action. The proposed action uses the dominant vegetation stand conditions that occur across the project area to delineate proposed treatment units (see project map). The dominant vegetation stand conditions include mixed conifer stands, lodgepole pine stands, aspen stands, and meadows/shrublands. There are conditions that occur across the project area where a management unit might be delineated as a mixed conifer stand but contain aggregations (1/2 acre to 5 acres in size) of the other dominant stand conditions. These aggregations could be expected to occur across 30% of any given unit and across more than 50% of the proposed units. As an example, in a unit designated as mixed conifer there may be areas within the unit that have aspen clones, meadows, or patches of lodgepole pine. In situations where aggregations occur across a unit, the appropriate treatment would be implemented as described below.

To achieve the goals of a resilient forest, proposed activities would maintain stand densities at levels appropriate for the site (Reineke 1933; Long and Shaw 2005). Topography, slope, aspect and elevation would be factored into each treatment (North et al 2009). Project design would incorporate important features including riparian areas and corridors, openings, aspen stands, and open and closed forests (Addington et al. Draft). Sustainable patches of mixed conifer species would be represented on north and west aspects. Reforestation treatments (tree planting of mixed conifer species) would occur in patchcuts and clearcuts of previously lodgepole pine dominated stands to promote a diverse forest in the face of a

changing climate (Kaufmann et al. 2012). Forested stands with high stand structural diversity would correspond to a greater and richer flora and fauna in all vegetation types across the landscape (O'Hara, 2014).

Management actions that promote the objectives described below, and result in a more diverse landscape, would lessen impacts of future disturbances such as wildfire within the watershed. Acres were derived by Geographical Information System (GIS) query and are referred to as mapped acres in this document. Exact acreage treated is verified on the ground prior to implementation. The Proposed Action Design Criteria provides additional detail to the management activities described below.

Mixed Conifer Stands

Historically, ponderosa pine and mixed conifer stands were characterized by a mosaic pattern of individual trees, clumps of trees with a diverse understory and openings across the landscape. Mixed severity fires, both human and natural caused, created this historic mosaic pattern where clumps or groups of trees were left unburned, understory trees were thinned, and openings were created. Mixed conifer stands in higher elevations were characterized by much lower fire frequency and patches of stand-replacing fire in addition to low-severity surface fires (Evans, Everett, Stephens, and Youtz, 2011). Within the project area, ponderosa pine and mixed conifer stands have departed from historic fire regimes (a pattern of fire occurrences, frequency, size, severity, and fire effects in a given ecosystem) in the era of fire suppression. Generally, mean forest cover rose from 57% prior to settlement to 83% currently, and the current condition of any one location (along the Front Range) is 3.7 times more likely to be forested now than prior to settlement (Dickinson 2014). Because fire has been excluded for decades, many ponderosa pine and mixed conifer forest stands now have interlocking crowns with few canopy openings, become overgrown with understory vegetation, and overall are homogenous rather than multi-age. As a result, these stands are more susceptible to insect and disease epidemics and uncharacteristically intense fire.

Mixed conifer stands include a species mix of ponderosa pine, Douglas-fir, limber pine, lodgepole pine, and aspen. Unit prescriptions in mixed conifer stands would be designed to mimic historic fire regimes and achieve desired spatial patterns representative of the vegetation type. Treatment prescriptions would utilize a variation of the individuals, clumps, and openings (ICO) approach and variable density thinning to restore the spatial pattern (Churchill, Dalhgreen, Larson, and Franklin, 2013). This approach would create clumps of trees (groups of conifers with interlocking crowns), individual trees, and openings between residual trees to address visual, ecological, or social concerns. Scientifically, there is a broad consensus that to increase resilience, treatments should seek to restore the range of patterns found in forests with intact disturbance regimes (Churchill et al. 2014, Covington et al. 1997, Allen et al. 2002, North et al. 2009, Stephens et al. 2010, Franklin and Johnson 2012).

Clumps would be achieved by thinning through all ages and size classes, generally retaining largest and healthiest trees. Each clump would contain a group of 2 to 12 trees, in some cases more based on diameter at breast height (DBH) cut limit, while maintaining a variety of spacing between other clumps or individual trees in order to accomplish the target volume reduction. Spacing between clumps and individual trees would range between 15 to 50 feet while maintaining the overall total basal reduction. Openings may be enhanced and expanded near meadow or aspen dominated areas. Areas where openings are created would generally remove tree age classes that are abundant across the project area. Thinning between the groups and openings would occur to create individual trees that would represent different ages and size classes.

Across the project area, there are ponderosa pine and Douglas-fir stands classified as old growth. These stands can occur as inventoried old growth, retention old growth, and old growth development as

described in the ARNF Land and Resource Management Plan (Forest Plan). Old growth was recognized as a unique forest structural stage prior to 1990 in the ARNF (Lowry 1992). The Forest identified and inventoried existing and future old growth stands based on characteristics unique to each dominant vegetation type. As a minimum rule, large live trees, some of which were old and declining, either snags or fallen trees, and greater than 20 percent overhead canopy closure were all prerequisites for a site to be called old growth (Lowry 1992).

In addition to the attributes that were used to identify old growth on the ARNF, disturbance mechanisms (i.e. fire, wind) created the complex mosaics that distinguish old growth conditions over time.

Disturbance is a key component that determines the quality of old growth in the ecosystem. The relative frequency, severity, and size of disturbance determine the amount and kind of old growth in a landscape (Spies and Franklin 1996, Johnson et al. 1995). On a temporal scale, stands of old growth development are important in the maintenance of old growth conditions spatially across the landscape.

There are 1,592 acres mapped as mixed conifer (see Proposed Action Map). Of the 1,592 acres, 42 acres are designated as old growth. Treatment prescription in units designated as mixed conifer would be as follows:

- Thin to reduce the stand density by no more than 40% in any given unit, including old growth development areas, from the existing volume or basal area while incorporating the spatial arrangement mentioned above.
- Areas designated as inventoried and retention old growth would have the density reduced by no more than 30%.
- All limber pine that do not pose a safety hazard, would be retained.
- All trees 16 inches DBH and larger would be retained.
- Treatment could be done mechanically or manually.

Density reduction is a key objective of restoration treatments for Front Range ponderosa pine and dry mixed-conifer forests; however, not all stands should have the same target density (Addington et al. Draft). Implementation of up to 40% volume reduction across a unit including in old growth development areas, 30% within old growth inventoried and retention areas, would allow for changes in units with various stand densities and different aspects. For example, a unit may have both north and south aspects within the boundary. The basal area on the north slope may have 200 sq. ft./ac. and the south aspect 80 sq. ft./ac. Using the thinning prescription, north aspects could be cut down to 120 sq. ft./ac. in areas outside of old growth and down to 140 sq. ft./ac. in old growth areas. South aspects could be cut down to 48 sq. ft./ac. outside old growth areas and down to 56 sq. ft./ac. Managing these mixed conifer stands following the basal area reduction described above allows an entire unit to be thinned meeting the fuel reduction objectives and continuing to move the stand towards the desired future condition while also benefiting wildlife.

Unit 74 is designated as a 2-staged mixed conifer treatment. This unit consists of Douglas-fir dominated stands with heavy downed surface fuels resulting from past disturbances. Because there is heavy fuel loading in the unit, two separate treatments would be performed.

Treatment prescription in Unit 74 (44 mapped acres – see Proposed Action Map), designated as 2-staged mixed conifer would be as follows:

- Stage 1 – Existing downed fuels would be hand piled and later burned. Due to the density of these stands, some live conifers up to 16 inches DBH may be cut and piled with the existing slash in order to establish openings and minimize the scorching of adjacent trees for pile burning.

- Stage 2 – Thin to reduce the stand density by no more than 40% from the existing volume or basal area while incorporating the spatial arrangement mentioned above. All limber pine that do not pose a safety hazard, would be retained. All trees 16 inches DBH and larger would be retained. Treatment could be done mechanically or manually.

The type of forest management or restoration described above would mimic mixed fire severity, create diversity in the vegetation across the landscape that was representative prior to fire suppression and settlement in the area, favor species for the future in a world of changing climate, and benefit wildlife species. These treatments are considered beneficial under a dynamic and changing climate as they enhance diversity (Gillette et al. 2014).

Lodgepole Pine Stands

Lodgepole pine stands have not departed from the historical fire regime. These stands are characterized by closed canopies, long fire return intervals (100+ years), and stand replacing fires that burn with high intensity and severity. Because these stands are homogenous in nature, they become susceptible to insect and disease under drought conditions. Creating a diversity of age structures between lodgepole pine stands would promote resiliency in the face of future insect and disease epidemics. Overall forest resilience to multiple disturbances can be increased when younger trees are a substantial component of the landscape (Taylor et al. 2006).

Across the project area, there are lodgepole pine stands classified as old growth. These stands can occur as inventoried old growth, retention old growth, and old growth development as described in the Forest Plan. Areas designated as or identified as old growth lodgepole would be excluded from treatment as required by the Forest Plan.

There are 1,378 acres mapped as patchcut/clearcut (see Proposed Action Map). Treatment prescription in units designated as patchcut/clearcut would be as follows:

- Patchcuts (removal of all conifer trees) could be 1-5 acres in size.
- Clearcuts (removal of all conifer trees) could be 5-20 acres in size.
- No more than 50% of a unit would be patchcut or clearcut.
- Untreated buffers of at least 100 feet would be left between patchcuts and clearcuts.
- Mixed conifer species may be retained in patchcuts or clearcuts if there is minimal potential for blowdown when the remainder of the stand is cut.
- Following treatment, plant patchcut/clearcut areas with mixture of conifer species.
- Treatment could be done mechanically or manually.

There are 14 acres mapped as regeneration thin (see Proposed Action Map). Treatment prescription in units designated as regeneration thin (areas previously patchcut/clearcut with trees less than 15 feet tall) would be as follows:

- Thin regenerated lodgepole pine to an average spacing of 10-15 feet.
- Treatment could be done mechanically or manually.

Aspen Stands

As a result of fire exclusion, aspen stands within the project area, for the most part, have been invaded by conifers. Over time, conifers often become established and decrease the available light, moisture, and nutrients for the aspen. As the stand grows, and shade on the site increases, conifer species eventually

replace the aspen. Reducing shading and competition created by conifer encroachment provides the opportunity for improved growing conditions and slows the natural successional pattern allowing for a longer retention of aspen on the landscape. While aspen's thin, living bark makes it prone to a host of insect pests and diseases, the primary threats to Colorado's aspen forests are chronic browsing (e.g. by elk and cattle) of young aspen shoots and more recently a wave of aspen die-off (referred to as 'sudden aspen decline') due to long-term drought. Aspen stands are generally areas of greater moisture that can reduce the intensity of wildfires.

Colorado's aspen forests provide essential wildlife habitat, are second only to riparian areas in terms of biodiversity richness, and provide a natural fire break. Younger aspen stands are often under-represented due to fire exclusion and encroachment of more shade tolerant conifers (Addington et al Draft). Aspen stands are described as areas where aspen stems greater than two inches DBH exceed the number of conifers in the stand.

There are 193 acres mapped as aspen (see Proposed Action Map). Treatment prescription in units designated as aspen restoration would be as follows:

- Cut all conifers, except ponderosa pine 16 inches DBH and greater, within and up to 50 feet of the edge of the aspen clone.
- Retain all limber pine.
- If snags are not available in the aspen stand, create snags within the aspen stand by girdling up to five of the largest conifers less than 16 inches DBH, unless they would pose a safety hazard.
- Treatment could be done mechanically or manually.

Meadows and Shrublands

Meadows and shrub patches can occur as small habitats within surrounding forested stands or as large meadow, shrubland, and grassland habitats. Meadows and shrublands are important habitat for a variety of wildlife species, add to the biodiversity of the project area, and provide a natural fire break. Conifer encroachment into mountain meadows and shrublands are common in the western United States mainly because of fire suppression. Historically, meadow habitat and shrublands were maintained by natural fire. Over time, conifer encroachment can reduce meadow, shrubland, and grassland habitats as well as the habitat diversity they provide. Meadows generally present areas of lower fire hazards due to the lack of canopy fuels. Areas of lower intensity can allow wildfire suppression efforts to be more safe and effective.

There are 54 acres mapped as meadow/shrubland (see Proposed Action Map). Treatment prescription in units designated as meadow/shrubland restoration would be as follows:

- Cut all ponderosa pine and Douglas-fir up to 14 inches DBH and all lodgepole pine up to 12 inches DBH.
- Retain all limber pine.
- Treatment would be done manually.

Private Home Defensible Space

Property owners in cooperation with the Colorado State Forest Service and Boulder County are continuing to create areas of defensible space around homes and other improvements on private lands. In order to comply with home insurance companies, some private landowners have been required to complete defensible space mitigation around their homes. Defensible space is the area around a home or other structure that has been modified to reduce fire hazard. In this area, natural and manmade fuels are

treated, cleared or reduced to slow the spread of wildfire. Creating an effective defensible space involves a series of management zones in which different treatment techniques are used.

Some of these private homes are in close proximity or adjacent to the U.S. Forest Service. For vegetation treatments to be most effective for these private property owners, the treatments need to be applied in a manner and location that complements existing defensible space efforts on private land. This project would provide homeowners the ability to complete the required defensible space across their property boundaries onto NFS lands.

Treatment units within 300 feet of private structures would include fuel reduction objectives to decrease wildfire hazard directly adjacent to those structures. In areas outside of proposed units, within the project boundary, where there are private structures located within 300 feet of the U.S. Forest Service boundary, private property owners would be permitted to complete defensible space treatments on NFS lands. There are 1,969 acres mapped as defensible space throughout the project area (see Proposed Action Map). These acres are being analyzed to provide homeowners adjacent to NFS lands the flexibility to treat on NFS lands. However, it is estimated that only a portion (estimated at up to 10%) of these analyzed acres would be treated. Treatment would follow the guidelines outlined by U.S. Forest Service resource specialists and in the Defensible Space Management Zones as described by the Colorado State Forest Service (CSFS 2012). There are three zones that characterize defensible space and are defined as the following:

- Zone 1 is the area nearest to the structures that requires maximum hazard reduction. This zone extends up to 30 feet outward from a structure where the most flammable vegetation would be removed including most trees. Remaining trees would be pruned to a height of 10 feet from the ground and be spaced at least 30 feet, or more if on steep slopes, between crowns.
- Zone 2 is a transitional area of fuels reduction between Zones 1 and 3. Typically this zone should extend at least 100 feet from structures. Stressed, diseased, dead or dying trees would be removed along with ladder fuels. Trees would be thinned to a crown spacing of at least 10 feet, or more if on steep slopes. Retained trees would be pruned to a height of 10 feet from the ground. Groups of trees may be left in areas however these groups would have at least 30 feet spacing between the crowns of the group and any surrounding trees.
- Zone 3 is the area farthest from the structure. It extends from the edge of Zone 2 out to 300 feet from the structure. Crown space thinning between retained trees would be variable and based on steepness of slope. Ladder fuels would be removed from underneath retained trees. Retained trees would be pruned to a height of 10 feet if located along trails or firefighter access routes.

Broadcast Burn

Broadcast burning across 970 mapped acres would be implemented after the completion of mechanical/hand treatments that overlap the burn units (see Proposed Action Map). The location of the broadcast burn unit boundaries is based on control features surrounding the primary burn areas, including forest roads and Gross Reservoir. The burn would be broken up into six operational burn blocks ranging from 72-340 acres in size to reduce the number of acres burned at any one time to allow the area to recover. The broadcast burn would focus on consuming up to 75% of the understory, including shrubs. Overstory mortality of up to 35% would be acceptable but not the focus of the broadcast burn.

Other Components of the Proposed Action

The Proposed Action Design Criteria provides additional detail to the management activities described previously. The implementation of Forsythe II vegetation treatments would be completed by contractors and/or by U.S. Forest Service employees. Either mechanized equipment or hand crews with chainsaws would be used to complete the treatments. Mechanized equipment operations are limited by the percent

slope and amount of rock within a unit. Treatment units that are over 30% slope would be treated manually. However, there may be short distances within a unit where a machine could be working on slopes up to 40%. In some instances, a unit may be designated as a mechanical unit but there may be areas within the unit that are too steep or rocky for a machine to work. In those circumstances, these areas would be treated manually or left untreated to incorporate variable density within the area.

Slash created by these treatments may be removed offsite, piled and burned, chipped, and/or masticated. Where mechanized equipment is used, forest products would most likely be removed in the form of logs, chips or firewood. After work is completed, firewood may be removed from the hand treatment units. Temporary roads may be constructed to facilitate the vegetation management activities and would be obliterated after the completion of treatment activities. There would be no new permanent roads within the project area.

An objective of this proposed action is to improve the health of the watershed. Unmanaged travel within the project area has resulted in unauthorized roads on NFS lands which have not been engineered to minimize erosion, nor planned with the larger travel system of the area in mind. These roads threaten forest resources, specifically soil and water. The U.S. Forest Service has reviewed all NFS roads and unauthorized routes within the project area (see attached map). The town of Nederland and residents of the Big Springs Subdivision have requested an emergency access route out of the subdivision to the south. There are two possible egress routes identified (Doe Trail and Wildewood Trail), both currently existing as trails, but only one of the routes would be converted to a NFS road for emergency egress purposes only. The recommendations listed below effect only the portions that cross U.S. Forest Service lands and take into account the transportation system necessary for public access, motorized recreation, and forest management while also accounting for the effects the roads have on the watershed.

The following recommendations include:

- Decommission or close NFS roads (5 miles).
- Decommission all Non-NFS (0.25 miles).
- Convert one trail near Big Springs Subdivision to a NFS road for emergency egress purposes only. Widening and other road work would be done and it would be gated on both ends.

The environmental and social effects of this proposed action and any subsequent alternatives will be analyzed in an Environmental Assessment. Public comment and collaboration, as well as input from Forest Service resource specialists, will be used to develop alternatives to this proposed action.

Public Involvement

The U.S. Forest Service encourages your participation in the planning process for the Forsythe II Project. To facilitate this involvement, an open house is scheduled for **Tuesday, January 11, 2016, 5 p.m. - 7 p.m. at Nederland Community Center in the Multi-Purpose Room**. The open house objectives are to provide information about and answer questions specific to this project proposed action. For more information about the proposed action including maps, please visit our website at www.fs.usda.gov/goto/arp/Forsythe2.

This project is subject to the objection process pursuant to 36 CFR 218. More information about the Objection Process can be found at www.fs.fed.us/objections/. In order to have standing to object to the project, you must submit a specific written comment during this comment period. The opportunity to

comment ends at midnight on the 30th day after publication of the legal notice in the Boulder Daily Camera. We anticipate publication on December 30, 2015.

You can submit your comments by email using this address: comments-rocky-mountain-arapaho-roosevelt-boulder@fs.fed.us. Comments may also be hand delivered to the Boulder Ranger District (2140 Yarmouth Ave., Boulder, CO) Monday thru Friday between 8:00 a.m. and 4:30 p.m., except holidays. Written comments may be mailed to the attention of Cambria Armstrong at 2150 Centre Ave., Building E, Fort Collins, CO 80526. Faxed comments may be faxed to (970) 295-6795. Cambria can also be reached at (970) 295-6768 should you have any questions about the project proposed action or the objection process.